Space Weather Forecast

Issued on Tuesday, 07 May 2024 at 01:29 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Moderate flares expected with chance of isolated strong flares. Chance of Minor-Moderate geomagnetic storm intervals due to CMEs (coronal mass ejections).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity is High. A large and complex sunspot region in the northwest has produced numerous moderate flares and a strong flare in the last 24 hours. This occurred at 06/0635 UTC. A second, larger region in the southeast is less active. Ten sunspot regions feature on the visible disc, 8 numbered and two unnumbered. The most active region located in the northwest, displaying a large and complex intermediate spot with a delta configuration. The second largest region on the disc and located in the southeast and approaching centre disc. This also has a delta configuration. A smaller region just east of the largest is complex in structure with both active regions magnetically linked. The remaining sunspots on the disc are generally smaller, stable or in slight decay, and magnetically simple. A CME observed in association with the strong flare at 06/0635 UTC may have an Earth directed component.

Solar Wind / Geomagnetic Activity: Solar winds were initially at low levels but became slightly elevated to elevated after connection with a high speed stream after 060600UTC and reached 593 km/s at 06/23234 UTC . The Interplanetary Magnetic Field was mostly at moderate levels throughout before declining to weak around 07/1730 UTC. The important north-south component was very variable but remained at weak to moderate levels. Geomagnetic activity was Unsettled to Active with Minor storm interval from 06/0000-0300 UTC, before returning to Quiet by 06/1800 UTC.

Energetic Particles / Solar Radiation: Solar radiation was at normal background levels.

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate to High solar activity is forecast to continue with further Moderate flares expected and a chance of isolated Strong flares, principally from the large sunspot regions located in the northwest of the visible disc.

Solar Wind / Geomagnetic Activity: There are multiple Earth-directed CMEs (coronal mass ejections) currently in the forecast period. A CME associated with the 04 May Moderate flare may give a glancing blow late early Day 1 (7th May). A CME associated with the 06 May strong flare may cause an impact late Day 1/early Day 2 (7th-8th May). A third CME may impact sometime during Day 2 (8th May). Earth is under the influence of a HSS (High speed stream) from a couple of coronal holes which is expected to continue through Day 1 before slowly declining through Days 2 and 3.
Geomagnetic activity at Quiet to Unsettled levels with a chance of Active to Minor Storm intervals in the event of CME enhancements, perhaps reaching Moderate storm levels. Activity should generally subside by day 3 (09 May) to reach mostly Quiet conditions by the end of the

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period.

Energetic Particles / Solar Radiation: Solar radiation levels is most likely to remain at background levels through the period. There is a slight chance for an S1/Minor Storm or greater event occurring throughout however, primarily from the large, complex sunspot region in the northwest disc.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	Yes	40	40	30	20
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	90	90	90	90
Very Active	R3 to R5 X	Yes	30	30	20	20

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	20	20	30	30
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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